

THE SOMERSAULTING AUTOMOBILE.

A leading attraction at many of the county and State fairs last summer was the thrilling exhibition of the somersaulting automobile. The automobile travels down a steep incline, at the bottom of which is a sharp upward turn, which shoots the machine into space, where it turns a complete somersault in the air and then drops onto a spring platform.

The somersaulting idea is not entirely new, for over a year ago we illustrated a French apparatus of this character which was on exhibition for a short while in this country. However, the methods of somersaulting the machine are very different in the two cases. In the French apparatus a system of springs and levers gives the rear of the car a throw just as it is leaving the track; while in the present apparatus, which was invented by Mr. Maurice Ganger, of this city, entire dependence is placed on the form of the track to properly somersault the machine, thus obviating all danger of breakage, and preventing that sudden jerk which was found to be so injurious to the performer in the French apparatus. The inclined chute consists of a pair of broad tracks for the wheels of the vehicle, and between these tracks are a pair of guide rails. The vehicle is provided with two ball-bearing rollers in front, which bear against the sides of the rails. The rollers are mounted on vertical axes, and serve merely to guide the machine laterally without interfering with its vertical movement. At the rear there are also two rollers, but these are mounted directly on the rear axle, and they ride on the top of the rails. The rails have a V-shaped upper tread, and as the rear rollers

are cut to fit this tread, they help to hold the machine in proper alignment with the track. As may be seen in the engraving, the guide rails terminate in a sharper upward bend than do the main tracks. The forward end of the vehicle follows the main track, while the rear is pitched upward by the guide rails. The vehicle is thus caused to turn a somersault forward.

Odd as it may seem, the car does not describe a loop anywhere in its course; for, to be sure, it must turn on its center of gravity, which is obliged to traverse a parabolic curve, just like a stone or any other body that is thrown through the air. So slow is the turning movement in comparison with the forward motion of the center of gravity, that no loops are described even by the wheels, though investigation shows that just after the car is launched, its extreme forward end momentarily moves backward and doubles on its course, while just before the landing is made, a similar loop is described by the

extreme rear end of the automobile. To illustrate the peculiar curves described by the car, we have plotted its course across the gap, showing its position at intervals of two feet, as measured along the horizontal. In order to avoid confusion, the car at the successive positions is shown alternately solid and in outline. The center of gravity at each stage is indicated by a

is necessary to obtain a proper relation between the pitch of the guide rails and that of the track. A variation of a fraction of an inch is sufficient to cause a bad landing of the car. If the guide rails were not used, and the rear of the machine were guided by the tracks on which the forward wheels travel, there would be a turning movement of only 1 or 2 degrees

per horizontal foot. By shortening the wheel base, the angle of rotation per foot may be increased, and conversely, by lengthening the wheel base the angle may be decreased until there is no rotary movement. Thereafter, further lengthening of the wheel base will cause the car to turn a somersault in the opposite direction.

The machine is, of course, merely a dummy automobile, for it carries no motor, brake, or steering gear. The performer is strapped to the seat, and has absolutely no control of the car. The car is well cushioned, and, as

may be clearly seen in one of the engravings, a pillow is placed under the strap to prevent injury to the occupant.

The total weight of the car loaded is about 800 pounds. It is drawn up, with an attendant, to the top of the incline, which is 50 feet above the ground. When all is ready the attendant releases the clutch, and the car shoots down with rapidly-increasing velocity. Just as it is about to take the leap it has a speed of 28 miles an hour. To the spectators the most thrilling moment occurs just after the car has passed the apex of its course, for here the performer, head downward, appears to be for the moment stationary, while the car swings rapidly over her. But

it is all over in an instant; for in less than a second the gap is traversed.

As may well be imagined, the greatest care must be exercised in arresting this tremendous projectile, and bringing it safely to a stop. For this purpose a landing platform of collapsible type has been invented. The platform is normally held in an inclined position by a series of heavy springs acting through the medium of four levers.

When the vehicle lands on the platform the latter collapses, and the shock is taken up by the springs. Then the machine rolls off and along the ground for a distance of 30 or 40 feet, until its energy is spent.

No mishaps have as yet occurred, though occasionally when all four wheels have not struck the platform at exactly the same instant, a wheel has been crushed by the terrific impact; for it should be borne in mind that an 800-pound car is no light object to be hurled across a gap of 20 feet.

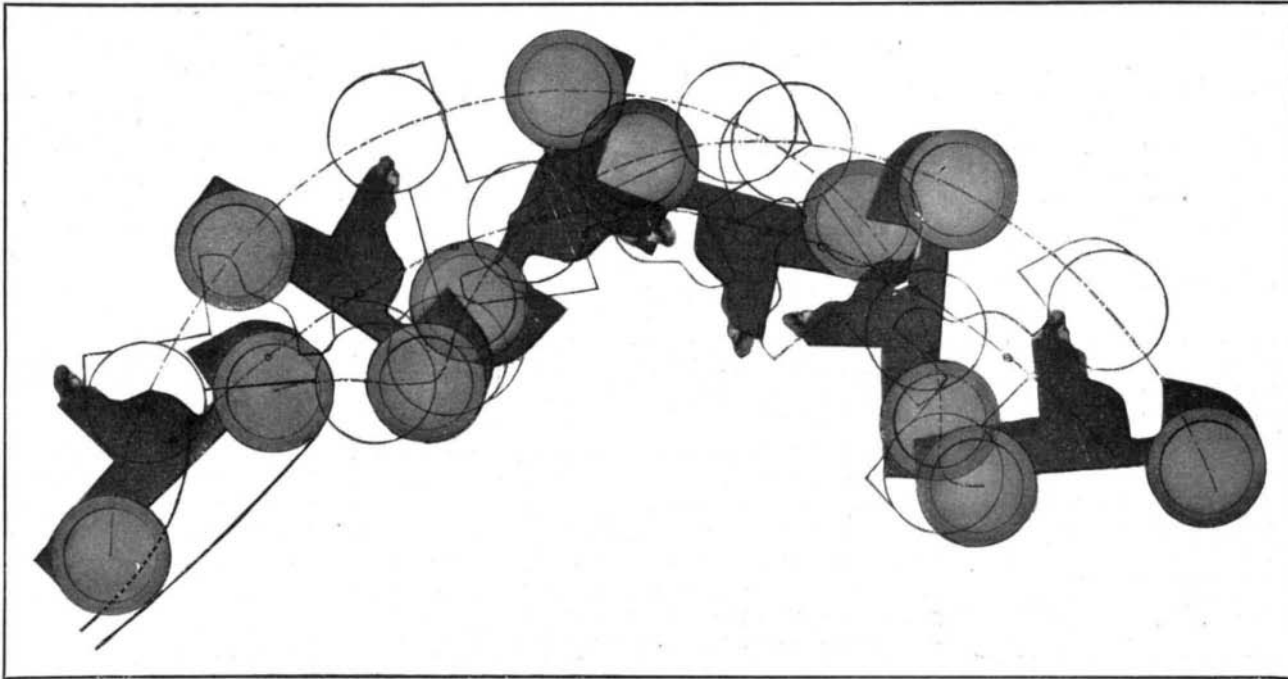


Diagram Showing Successive Positions of the Automobile in Its Leap Across the Gap.

dot, and these dots are connected by a broken line which, as will be observed, is a parabola. Two of the broken lines show the paths followed respectively by the forward and rear wheels. The front wheels leave the track with the car inclined at an angle of 45 degrees; but the rails which guide the rear rollers pitch the rear of the car upward through an angle of 40 degrees, during which time the center of gravity moves two feet forward, as measured in a horizontal direction. The car, now clear of the track, continues the turning movement at the rate of 40 degrees for every two feet of horizontal advance until it eventually lands upon the spring platform at the end of the gap.

In the construction of the incline, the greatest care



The Forward End of the Car Momentarily Stands Still While the Rear Swings Over.

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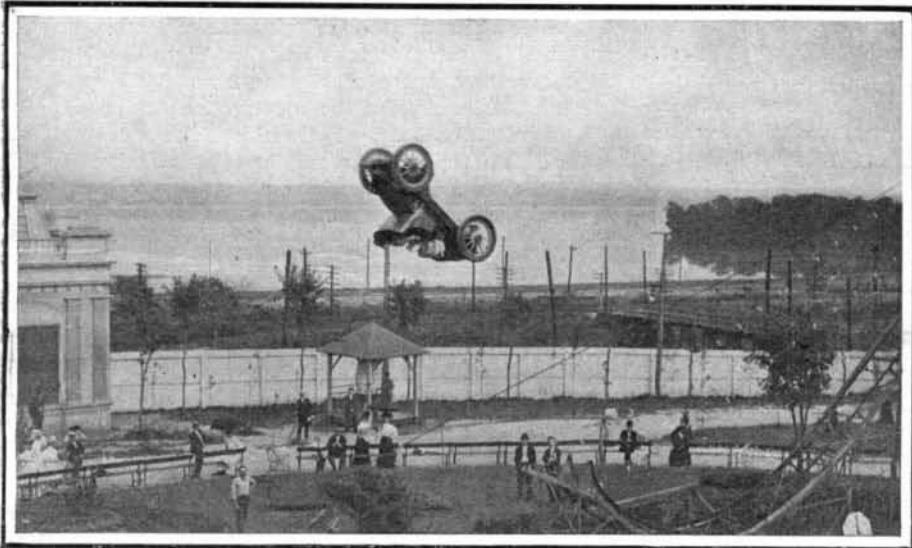
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Strapping the Performer to the Seat.



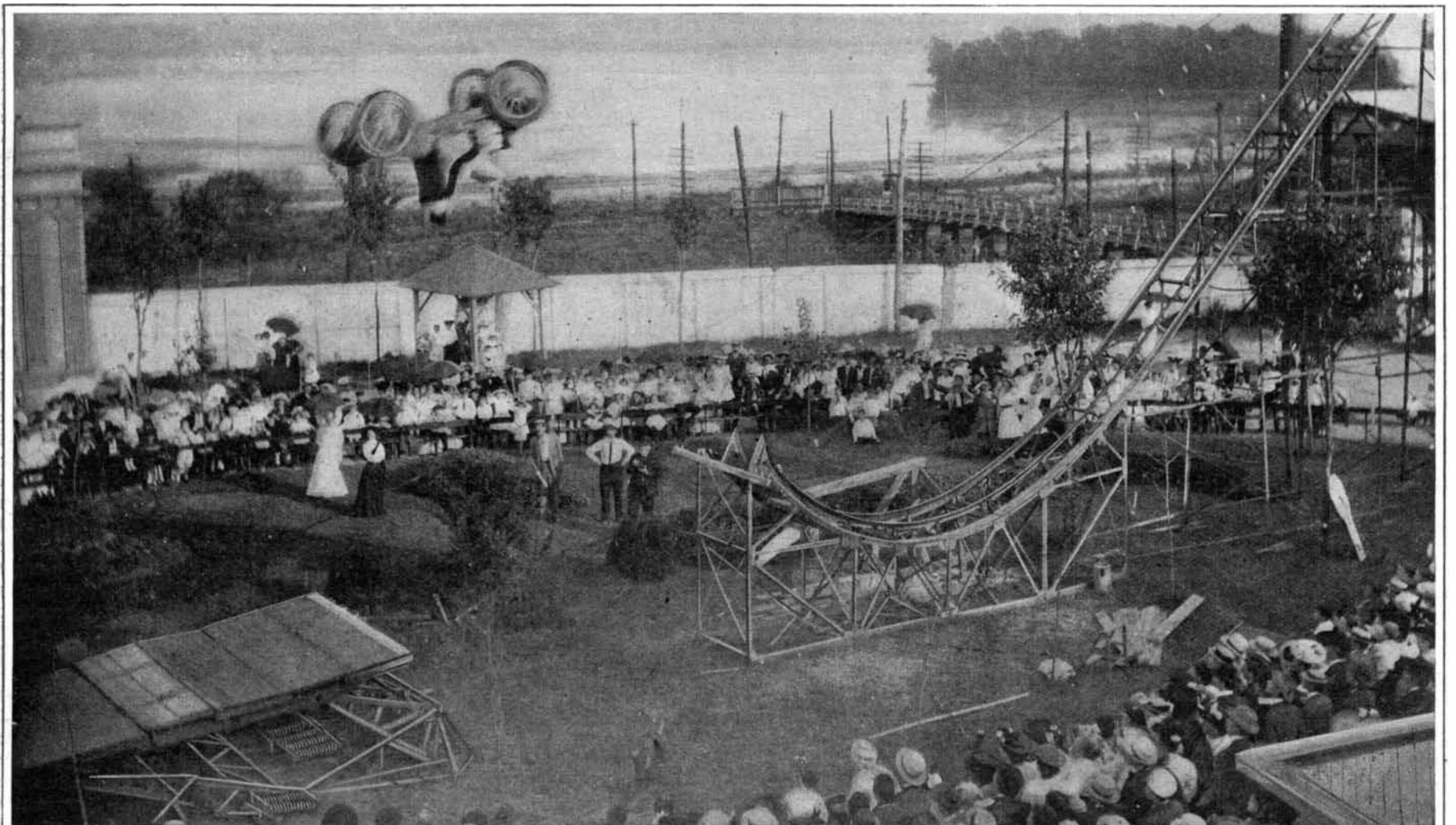
The Start—Just After the Clutch Has Been Released.



The Rear of the Car Has Swung Over and the Front is Rising.



The Performer's Head is Stationary While the Car Swings Over It.



The Car Shoots Down an Incline, and, Turning a Somersault in Midair, Leaps a Gap, and Lands On a Spring Platform.

THE SOMERSAULTING AUTOMOBILE.—[See page 132.]